New Jersey Department of Environmental Protection
Water Quality-based Effluent Limits for Total Phosphorus
A Synopsis of the Department's Responses to Permittee Comments
October 2002

INTRODUCTION

On May 24, 2002 Commissioner Bradley M. Campbell met with representatives of Sewerage Authorities to discuss the New Jersey Department of Environmental Protection's (hereafter the Department) initiative for the control of phosphorus discharged to the State's freshwater streams and lakes.

At this meeting, Commissioner Campbell announced that to comply with the requirements of Clean Water Act, the Department intends to fully implement the existing ambient water quality criteria (WQC) of 0.1 mg/L for total phosphorus. This would be accomplished through the imposition of appropriate water quality based effluent limits (WQBELs) in New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to surface water permits. In addition to responding to a number of questions and comments from the sewerage authorities representatives attending the meeting, the Commissioner also provided an informal opportunity to submit written comments and suggestions to the Department by June 24, 2002. A total of thirty-six (36) permittees or their representatives (list attached) submitted written comments. A synopsis of the major comments received and the Department's responses is provided below:

1. **Basis for Applying the 0.1 mg/L Total Phosphorus Criterion as an End-of-Pipe Effluent Limitation.**

   Numerous commenters questioned the Department's basis for using the total phosphorus criterion of 0.1 mg/l directly as a water quality based effluent limitation. Others stated that the Department could not directly apply the total phosphorus criterion as an effluent limitation without first undertaking a rule change to authorize it.

   Response: The Department believes that existing rules clearly establish the Department's authority to apply the criterion as an effluent limitation. Therefore, no rule change is necessary.

   In accordance with N.J.A.C 7:14A-13.5(a), water quality based effluent limitations (WQBELs) are required when a pollutant or pollutants, "…are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above the Surface Water Quality Standards." Any discharge containing phosphorus that discharges to a waterbody segment included on the 303(d) list for exceeding the numerical phosphorus criteria, meets the conditions set forth at N.J.A.C. 7:14A-13.5(a) for requiring a WQBEL for phosphorus. In accordance with N.J.A.C. 7:14A-13.6, "When the Department determines pursuant to N.J.A.C. 7:14A-13.5 that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a Surface Water Quality Standard, a

water quality based effluent limitation for each pollutant … shall be determined in accordance with the USEPA TSD[1]…"

In the calculations for a phosphorus WQBEL, if the upstream concentration is equal to or greater than 0.1 mg/L (which is always the case for a waterbody segment listed as water quality impaired for phosphorus on the 303(d) list), and 0.1 mg/L is the ambient water quality criteria, then the water quality based effluent limitation will be 0.1 mg/L. The equation used to calculate the wasteload allocation (WLA) can be found in section 7.2.4 of the "Technical Support Document For Water Quality-based Toxics Control" (TSD), EPA/505/2-90-001, March 1991. The water quality based effluent limitation calculation procedure is contained in section 5.4 of the TSD. The Department sets the average monthly limit (AML) equal to the calculated WLA. Therefore, for dischargers to waterbodies listed as impaired for phosphorus on the 303(d) list, the AML equals the WLA, which, based on the equation in Section 7.2.4 of the TSD, will equal 0.1 mg/L as indicated above. Therefore, an effluent limitation of 0.1 mg/L of total phosphorus for affected discharges to a 303(d) listed waterbody is mandated by N.J.A.C. 7:14A-13.5(a) and 13.6(a).

This approach is fully consistent with USEPA's position as discussed in the adoption of revisions to the National Pollutant Discharge Elimination System (NPDES) Program Rules and the Federal Antidegradation Policy (see the Federal Register, 65 FR 43638, July 13, 2000). Excerpts from that document which support the Department's position include the following:

"…further degradation of already impaired waterbodies should be prevented and that progress toward the attainment of water quality standards should be made in the interim period between the identification of an impaired waterbody and the establishment of a TMDL." center column, center, page 43640

"…EPA expects to achieve progress toward the attainment of water quality standards in impaired waters in the absence of a TMDL." center column, top, page 43641

"For discharges to an impaired water…including background pollutant concentrations in all permit limit calculations will result in water quality-based effluent limits based on a wasteload allocation that attains the applicable criteria or a lower pollutant concentration in the effluent (i.e., "criteria end of pipe" or better)." left column, bottom, page 43642

Since the Department is utilizing existing rules for water quality based effluent limitations, existing water quality criteria for phosphorus, and is taking existing 303(d) designations into account, a rule change to authorize the inclusion of the 0.1 mg/L as an effluent limitation for total phosphorus is not required.

2. Basis for the 0.1 mg/L Total Phosphorus Criterion and Suggested Alternatives.

[1] Technical Support Document For Water Quality-based Toxics Control" (TSD), EPA/505/2-90-001, March 1991.

Many commenters questioned the basis for the WQC for total phosphorus of 0.1 mg/L at N.J.A.C. 7:9B-1.14(c)5. In addition, a number of comments were submitted supporting an alternative to the 0.1 mg/L criterion that was proposed by Dr. Raymond Ferrara of TRC Omni Environmental Corporation approximately 10 years ago. In that paper, Dr. Ferrara suggested that the State's existing phosphorus numerical/narrative criteria be replaced with narrative criteria and numerical goals, and indicated that the Department should conduct additional research to establish the numerical goals.

Response: The 0.1 mg/L total phosphorus criterion has been promulgated in the Department's Water Quality Standards regulations since 1981.The criteria is consistent with the 1986 United States Environmental Protection Agency (EPA) document "Quality Criteria for Water" (known as the Red Book). The origin of the 0.1 mg/l criteria may be found in the 1973 publication "Toward a Cleaner Aquatic Environment" by Kenneth M. Mackenthun, EPA, Office of Air and Water Programs.

Many of the commenter's suggestions concerning the criteria, including Dr. Ferrara's, would require the development of new regulations, which would only further delay the implementation of phosphorus controls in the State. The Department believes that the existing criteria, with the options they contain, are adequate for moving forward to address phosphorus now in a meaningful way.

That is not to say that the Department will not be considering making refinements to the phosphorus criteria in future rulemakings, the Department commonly updates water quality criteria as new information becomes available. Regarding criteria for phosphorus, in January 2001, the U. S. Environmental Protection Agency (EPA) announced the publication of seventeen (17) nutrient water quality criteria documents for lakes and reservoirs, rivers and streams and wetlands within specific geographic regions (ecoregions) of the United States (66 FR 1671). These recommended water quality criteria for nutrients were developed to reduce and prevent eutrophication on a national scale. This information is intended to serve as a stating point for states, authorized tribes and others to identify more precise numeric levels for nutrient parameters needed to protect aquatic life, recreational, or other uses on site-specific or region specific conditions.

3. Availability of Treatment Technology.

Many of the commenters stated that consistent compliance with the 0.1 mg/L total phosphorus effluent limit might not be technically possible. Others stated that compliance with the limit could cause significant increases in the discharge of total dissolved solids (TDS), metals, and the quantity of sludge generated. It was also suggested that the TDS criteria should be increased or not applied at all if phosphorus requirements are implemented.

Response: The Department does not agree that the limit is not achievable. Information submitted by a commenter provides examples of facilities that either are or will be required to consistently achieve a total phosphorus effluent concentration of 0.1 mg/L or less, including a 25 MGD facility in Durham, North Carolina and an 80 MGD facility in Syracuse, New York. They are/will be utilizing various combinations of existing wastewater treatment technology to do so.

In New Jersey, the Borough of Oakland, Chapel Hill Estates STP (NJ0053112) has monthly and weekly average total phosphorus effluent limitations of 0.05 mg/L and 0.075 mg/L respectively and has not reported an effluent concentration value that exceeded either of those limits for the Discharge Monitoring Reports (DMRs) for the period December 1998 through April 2002 (41 consecutive months).

The impact on TDS and metals concentrations in the effluent will need to be considered and addressed in developing the design process for the upgraded facilities. This will have a major influence on the process selected, as will the increased sludge production and disposal concerns.

4. Cost Of Compliance.

Many commenters stated that the cost of complying with a total phosphorus effluent limitation of 0.1 mg/L would be excessive when compared to the water quality benefit achieved. Some indicated that even if the point source discharges were to fully comply with a 0.1 mg/L total phosphorus effluent limitation, there might be little or no benefit to the receiving waters, especially if non-point source discharges were not controlled.

Response: The Department recognizes that significant costs will be incurred by permittees in meeting a 0.1 mg/L effluent limitation for total phosphorus. The Department will work with the permittees to explore means and options to reduce their costs. These include low interest financing through the New Jersey Environmental Infrastructure Trust (NJEIT) and alternate compliance means such as trading between point sources as well as between point and non-point sources. The optional demonstrations regarding the limiting nutrient and use impairments will help ensure that a treatment plant upgrade would only be required if the permittee is unable to demonstrate that phosphorus is not the limiting nutrient and that there is no use impairment of the receiving waters due to phosphorus. In such circumstances, the Department believes there would be an environmental benefit to undertaking the treatment plant upgrade to achieve WQBELs for Phosphorus. None of the comments that were submitted to the Department identified a specific case where a discharger decreased the concentration of total phosphorus to 0.1 mg/L or less in their effluent and yet no environmental benefit was realized.

The Department is also taking steps to control of non-point sources:

> Over $2 million has been spent on Best Management Practices for agricultural lands to reduce nutrient runoff. The Conservation Resource Enhancement Program, when implemented, will provide federal and state funds for the purchase of stream corridor easement and the implementation of non-point source controls on associated farms. Additionally, local and state programs for the purchase of open space will minimize pollution and help preserve water quality.
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> The Department's forthcoming Stormwater Management Rule and the new NJPDES Municipal Storm Water Regulation Program will enhance storm water runoff quality by

addressing new development, redevelopment and existing development; stressing pollution prevention, source reduction and public education; and by requiring additional measures to address watershed specific problems.

5. Use of Existing Data and Studies.

Several commenters indicated that there are existing specific studies and data that could be used to address the phosphorus issue for certain dischargers to certain waterbodies.

Response: Permits containing the 0.1 mg/L effluent limitation will contain provisions that give permittees the option to explore the appropriateness of this limit through a limiting nutrient analysis and use impairment analysis pursuant to the provisions of N.J.A.C. 7:9B-1.14(c)5. The Department is in the process of developing a guidance document for both of these analyses. Existing data and studies provided by the permittee would be considered and reviewed in the context of this guidance document, and to the extent that the information is applicable in whole or part, it will be appropriately used.

6. Total Maximum Daily Load (TMDL) Process.

Many commenters indicated that the Department should not abandon the TMDL process for evaluating the need for, and specific level of, nutrient control. Commenters supported the TMDL process as a fair and scientifically defensible method for making such determinations.

Response: The Department is committed to proceed with, and to the extent feasible, speed up necessary TMDL studies. However, beyond TMDLs, the Department has the federally mandated responsibility to address existing exceedances of the phosphorus WQC in impaired waterbodies (i.e., 303(d) listed water body segments) using the water quality standards and criteria that are presently in effect through the NJPDES permitting program.

While the Federal Clean Water Act and EPA's implementing regulations (as reflected in the Department's own regulations) establish two approaches for the development of necessary WQBELs for discharge to surface water permits: through the TMDL process or through the development of site specific WQBELs, there is no provision in the federal regulatory framework that either recognizes that one approach to WQBEL development is better for a particular pollutant or that would allow for deferring the imposition of WQBELs until the TMDL process is complete.

7. 303(d) List.

Several commenters indicated that the 303(d) listing of water body segments as being phosphorus impaired were often based on outdated or inadequate information.

Response: The Department periodically updates the information used to develop the 303(d) list. A draft (2002) 303(d) list was made available for public review and comment earlier this year. The comments received are presently being considered and the final 303(d) list will be issued once the responses to those comments have been completed. The structure of the list has been modified and the information (data) that was collected subsequent to the adoption of

the 1998 list was reviewed and included to develop the 2002 list. Any comments about the validity and adequacy of data used in developing the 303(d) list must appropriately be made within the public comment process that exists for promulgation of the list.

8. Passaic Stipulation of Settlement.

Some commenters expressed concern about the Department's future actions affecting the Upper Passaic Basin dischargers into 303(d) listed waterbodies. They wanted to be assured that the Department would (1) continue to honor the Stipulation of Settlement, (2) expedite the TMDL process in the Passaic River, and (3) incorporate the interim effluent limits from the Stipulation of Settlement and utilize the TMDL process for determining the ultimate permit limits for phosphorus in upcoming permit renewals.

Response: At the May 24, 2002 meeting, Commissioner Campbell announced his decision to honor the Passaic Stipulation of Settlement (i.e., "Hanover Sewerage Authority, et. al. v. NJDEP'" consolidated Dkt. No. EWR 7096-96, executed January 20, 2000, or equivalent) and to accelerate the Passaic River Basin TMDL process that would lead to the imposition of the WQBELs in the shortest time possible.

9. Small Discharger Exemption

A few commenters asked for an exemption from the 0.1 mg/L effluent limitation for small dischargers that do not significantly contribute to the instream exceedances for total phosphorus.

Response: There are no provisions in the existing regulations that would exempt a facility from a WQBEL based solely on size. Small dischargers will be given the same opportunity as all other dischargers, i.e., to provide justification (studies) that phosphorus is not the limiting nutrient and is not impairing uses. The Department encourages the dischargers along a waterbody segment to undertake joint efforts for completing the necessary studies and to explore prudent trading options so that the total cost for meeting the required limit can be minimized.

10. Other Approaches

Several commenters indicated the Department should control the introduction of phosphorus into the treatment works, by banning detergents and cleaning products that contain phosphorus from being sold in the State, regulating the use of fertilizers on lawns and regulating the use of corrosion inhibitors by water purveyors.

Response: The Department agrees that these and similar approaches for reducing the total phosphorus loadings to the State's waterways should be explored. Regarding the use of fertilizers, the NJPDES Municipal Stormwater Regulation Program that is being developed will include statewide public education and outreach provisions.

The NJPDES rules for land application of biosolids in agriculture at N.J.A.C. 7:14A-1 et seq. define agronomic rate to include all plant nutrients to minimize losses not just to ground

water but to surface water, as well. Under the authority of these rules, the Department is beginning to modify its biosolids land application program to address impacts from all nutrients found in biosolids including phosphorus.

The Department intends to explore, together with the New Jersey Department of Agriculture, other agricultural institutions, and with the farmers of the state, programs that enhance the protection of ground and surface water resources from the impacts of commercial agriculture

CONCLUSION

The Department appreciates the commenters for their input in this decision making process. However, in view of the environmental need, statutory mandates, and based on the above discussion, the Department intends to move forward in implementing the WQC for total phosphorus as outlined at the May 24, 2002 meeting and in accordance with the existing regulations.

The Department is proceeding to impose a WQBEL for total phosphorus where the numerical criteria for total phosphorus in the receiving waters has been exceeded. In accordance with the provisions of the WQC, the permits would allow the discharger(s) to demonstrate that phosphorus is not a limiting nutrient and that existing and designated uses are not otherwise impaired. The Department is also preparing a technical guidance document with specific protocols to be followed for the limiting nutrient analysis and use impairment analysis and will soon make it available to the sewerage authorities. Permittees that are successful in demonstrating that phosphorus is not the limiting nutrient and does not otherwise impair the existing and designated uses shall not be subject to the 0.1 mg/L phosphorus limitation.

A number of permittees have expressed interest in follow-up meetings on the phosphorus initiative. The Department anticipates that additional meetings will be necessary with individual permittees (or groups of permittees on the same waterbody) to discuss conducting the optional studies based on the guidance the Department is developing and permit specific issues. The Department will continue working with the sewerage authorities to resolve additional details as necessary. In addition, the Department will remain open to pollutant trading options, even without a TMDL. The Department is committed to working with the dischargers to advance the mutual goal of protecting the State's precious water resources and to satisfy the mandates of the Federal Clean Water Act.